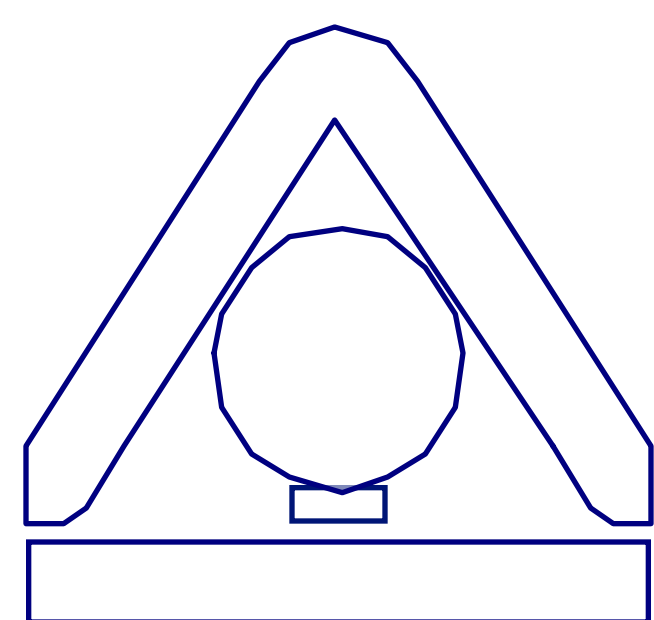


POLYPHENOL OXIDASE AND PECTINMETHYLESTERASE ENZYME ACTIVITIES IN PEARS AFTER STORAGE IN CONTROLLED ATMOSPHERES



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INTRODUCTION

Storage in Controlled Atmospheres (CA) has been used as a normal practice for the extension of the shelf-life and the maintenance of the quality of fruits and vegetables. Polyphenol oxidase (EC 1.14.18.1; PPO) enzyme has been associated with the enzymatic browning in fruits and vegetables. Browning of fruits may arise during storage, limiting their shelf-life. Oxygen is essential for the natural browning of plant substrates; so using controlled atmospheres with low level of oxygen is expected to reduce PPO activity. Pectinmethylesterase has been associated with fruit softening and the increase in PME activity was detected with the softening of some fruit. The aim of this work was to establish a correlation between the two enzyme activities and the decreased in the firmness of 'Rocha' pear after storage for nine months in different compositions of CA atmospheres.

MATERIAL AND METHODS

'Rocha' pear, a Portuguese variety was picked at commercial maturity in August, 1997.

Pears stored in air or in CA:
 2% or 4% O₂
 with 0.5% or 1.5% CO₂

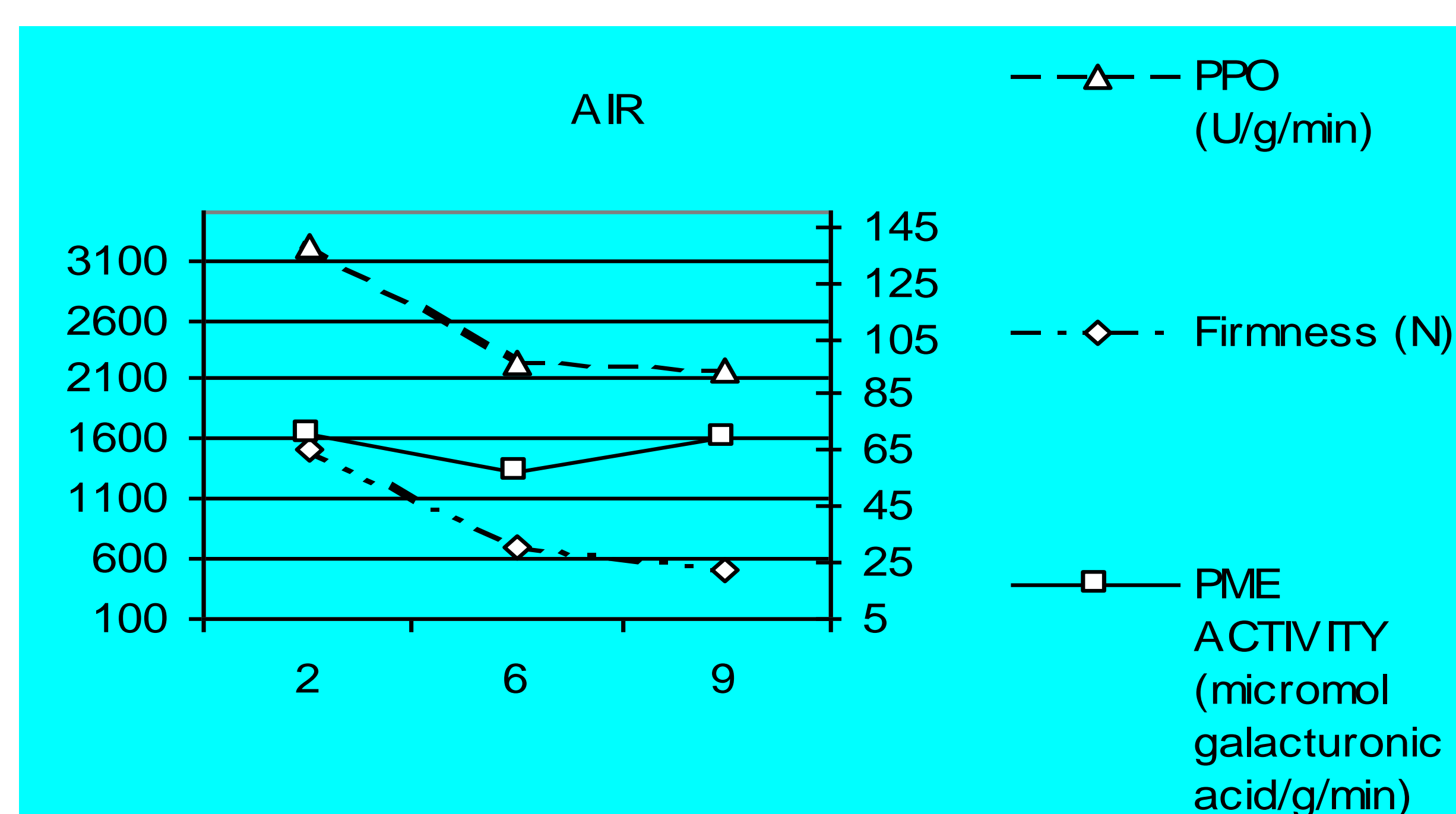
Fruits were removed from storage and allowed to ripen at room temperature (19-20 °C)

Analysis

Firmness determination: Universal Testing Machine (INSTRON 4500)

- PPO enzyme activity was determined following the method described by Galeazzi *et al* 1981 and Rocha *et al* 1998.
- PME enzyme activity was determined following the method described by Hagerman *et al* 1986

RESULTS AND DISCUSSION



- PME decrease for fruits stored under air and the two conditions of 4% O₂ after six at room temperature.
- Pears stored under the two levels of 2% O₂ presented an increase in PME activity.
- After nine days at room temperature fruits from air and 4% O₂ presented the lowest activity. Fruits from the two conditions of 2% O₂ had the highest activity.
- PPO activity was higher for fruits from the air condition and the 4% O₂ + 0.5% CO₂ after two days of exposure to air at room temperature.
- After six days of exposure at room temperature PPO activity decrease for fruits from all the conditions. values.

Figure 1. PPO enzyme activity (U/g/min) of 'Rocha' pear after seven months of storage in controlled atmosphere and exposure to air at room temperature (19-20°C)

CONCLUSIONS

After nine months of storage fruits stored under 2% O₂ + 1.5% CO₂ presented the lowest level of PPO and PME enzyme activities. A positive correlation was found for the those enzymes and the fact that the fruits from this condition presented the lowest firmness after exposure at room temperature

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